

Flatcar and Gentoo sitting in a tree

A collaboration of distributions

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(E - M - E - R - G - I - N - G)

Hello there!

I'm James Le Cuirot, better known as Chewi.

- Flatcar maintainer by day (at Microsoft)
- Gentoo developer by night
- Resident of Edinburgh, Scotland 🇬🇧
- Known to do silly things like run Gentoo on a Commodore Amiga 1200 from 1993



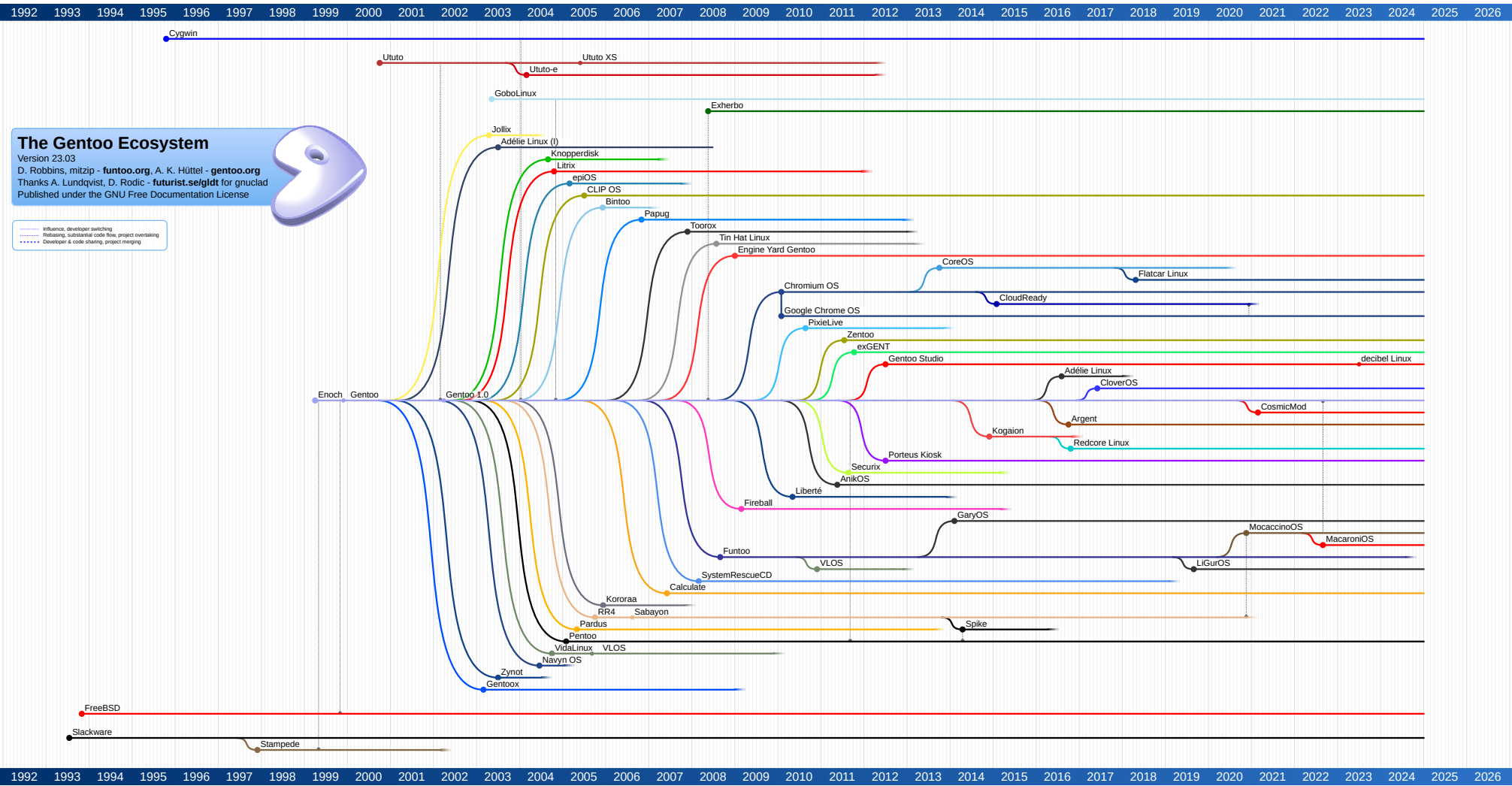
Meet the distros

Gentoo Linux

- Created circa 2000
- Community-maintained
- Source-based distro
- Not derived from another
- General purpose
- Extremely flexible
- Supports many architectures

Flatcar Container Linux

- Forked Container Linux in 2018
- Community-maintained
- Immutable distro
- Derived from Gentoo
- For container workloads
- Orchestrated
- Supports amd64 and arm64 on VMs and bare metal



Sitting in a tree?

Flatcar's main repository includes a subset of the Gentoo package repository.

```
chew@ignea ~/Projects/flatcar/scripts $ ls sdk_container/src/third_party/portage-stable
CHANGELOG.md      app-doc           dev-cpp           eclass           net-nds          sys-devel
MAINTAINERS.md    app-editors       dev-db            licenses         net-vpn          sys-firmware
README.md         app-emulation     dev-debug         media-libs       perl-core        sys-fs
acct-group        app-eselect       dev-embedded      metadata         profiles         sys-kernel
acct-user         app-misc          dev-go            net-analyzer     scripts          sys-libs
app-admin         app-portage       dev-lang          net-dialup       sec-keys         sys-power
app-alternatives app-shells        dev-libs          net-dns          sec-policy       sys-process
app-arch          app-text          dev-perl          net-firewall     sys-apps         virtual
app-cdr           app-vim           dev-python        net-fs           sys-auth         x11-base
app-containers    changelog         dev-util          net-libs         sys-block       x11-libs
app-crypt         dev-build         dev-vcs           net-misc         sys-boot        x11-misc
```

How has the relationship evolved?

- Since ChromiumOS, Chewi is the first maintainer to wear both hats. Maybe not the last?
- **Container Linux**: 2013 to 2020
7 commits to Gentoo's package repo.
- **Flatcar**: 2018 to present
At least **130** commits to Gentoo's package repo.
Chewi commits as chewi@gentoo.org so counting is hard.
Includes 47 commits from the rest of the team.
- Number of packages “forked” into Flatcar is reducing.
- In general, Flatcar sees aligning closer to Gentoo as a good thing.



How does Gentoo help Flatcar?

- *Not* by asking what Flatcar needs.
- That isn't what Flatcar needs!
- Flatcar chose Gentoo because it was already a great fit.
 - It is flexible.
 - It is great for cross-compiling.
- **Gentoo helps by continuing to be well-maintained.**
 - It keeps the packages Flatcar uses updated with strong adherence to QA.
 - It applies security fixes affecting Flatcar promptly.
 - It handles contributions from Flatcar competently.

How does Flatcar help Gentoo? – Cross-compiling

- Flatcar entirely cross-compile its images, even amd64.
- Chewi has long been Gentoo's cross-compile guy.
- Flatcar has helped by:
 - Fixing cross-compile issues in many packages and eclasses.
 - Enhancing the crossdev toolchain utility.
 - Removing the need for extra flags when using alternative sysroots.
 - Making it possible to cross-compile prefixed systems.

How does Flatcar help Gentoo? – Portage

Chewi *tried* to implement circular dependency resolution. Watch this space?

```
[nomerge      ] kde-plasma/plasma-meta-6.1.4-r1:6::gentoo USE="bluetooth browser-integration c
[nomerge      ] sys-fs/udisks-2.10.1-r1:2::gentoo USE="acl daemon introspection systemd -debu
[nomerge      ] sys-auth/polkit-125::gentoo USE="daemon duktape introspection kde pam system
[ebuild      U] dev-libs/gobject-introspection-1.80.1-r2::gentoo [1.78.1-r2::gentoo] USE="-d
[ebuild      U] dev-libs/glib-2.80.4:2::gentoo [2.78.6:2::gentoo] USE="dbus elf introspecti
```

Total: 2 packages (2 upgrades), Size of downloads: 6422 KiB

* Error: circular dependencies:

```
(dev-libs/gobject-introspection-1.80.1-r2:0/0::gentoo, ebuild scheduled for merge) depends on
  (dev-libs/glib-2.80.4:2/2::gentoo, ebuild scheduled for merge) (buildtime)
    (dev-libs/gobject-introspection-1.80.1-r2:0/0::gentoo, ebuild scheduled for merge) (buildtime)
```

It might be possible to break this cycle
by applying the following change:

```
- dev-libs/glib-2.80.4 (Change USE: -introspection)
```

How does Flatcar help Gentoo? – New packages

- Some Flatcar maintainers use Gentoo to do their work.
- Many more Microsoft engineers use Linux. Maybe Gentoo?
- Flatcar's SDK is basically a Gentoo image.
- Flatcar has therefore added new packages to Gentoo:
 - Intune (for access to corporate resources)
 - Azure VPN Client
 - azure-vm-utils
 - Git Credential Manager
 - Azure SDK for C++



How does Flatcar help Gentoo? – VM firmware

- **EDK II is an open-source implementation of UEFI.**
- **Commonly used for VMs with QEMU.**
- **Flatcar uses it for development and testing.**
- **It was unloved in Gentoo with pending bumps and open bugs.**
- **Flatcar has helped by:**
 - Bumping the package to the latest version... twice.
 - Making Secure Boot work out of the box.
 - Adding support for architectures other than amd64.
 - Providing firmware images in multiple sizes and QCOW2 format.
 - Resolving most of the open bug reports.

How might Flatcar help Gentoo in the future?

- More of the above!
- Assist with keywording and stabilisation by using Flatcar's extensive CI tests.
- Add machine readable output (e.g. JSON) to Portage.
- Fix Gentoo Prefix issues.



Final thoughts

- ~~Derivative~~ distributions are mutually beneficial.
- Maintaining a distribution can be your day job.
- There can be a healthy relationship between paid and unpaid maintainers.

